

## REMARKS

The Office Action mailed November 12, 2008 has been carefully reviewed and the foregoing amendment and following remarks have been made in consequence thereof.

Claims 1, 3, 5, 6, 8-20, and 22 are pending in this application. Claims 8-20 are withdrawn from consideration. Claims 1, 3-6, and 22 stand rejected. Claim 4 has been cancelled.

The rejection of Claims 1, 3-6, and 22 under 35 U.S.C. § 112, second paragraph is respectfully traversed. Claim 1 has been amended to address the issues raised in the Office Action. As such, Applicants respectfully submit Claim 1 satisfies Section 112. Claim 4 has been cancelled, and Claims 3, 5, 6, and 22 depend from Claim 1. Accordingly, for at least the reasons set forth above, Applicants respectfully request that the rejection of Claims 1, 3-6, and 22 under Section 112, second paragraph be withdrawn.

The rejection of Claims 1 and 3-6 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 6,438,838 (Meier) in view of U.S. Patent 3,650,635 (Wachtell) or in the alternative as being obvious over Meier in view of U.S. Patent 6,912,446 (Wang) and Wachtell is respectfully traversed.

Meier describes a method for repairing a vane (5) for a turbine. The repair method includes severing and removing a damaged section (4') of vane (5) along a plane (12) such that a stub (13) is formed. During the repair process, an inductor (16) is coupled to a periphery (15) of stub (13) to heat and soften periphery (15). A replacement vane (20) that corresponds in shape and curvature to stub (13) is aligned with and is then welded to stub (13) in a protective gas atmosphere using high-frequency welding. Specifically, when a high-frequency current is applied to inductor (16), the material of stub (13) and replacement vane (20) melts together to enable replacement vane (20) and stub (13) to be bonded together. Notably, Meier does not describe nor suggest providing a replacement blade portion that is produced using a substantially similar method as was used to produce the removed portion wherein the method includes at least one of forging and casting. Rather, Meier describes coupling cast vanes to forged rotors.

Wachtell describes a method for repairing damaged or defective turbine guide vanes (21). A substantially-rectangular, longitudinal section of the vane, including the defect (not shown) is cut from vane (21) and is removed. A substantially-rectangular, longitudinal insert (23) is then welded to vane (21) using either tungsten inert gas welding or electron beam welding to couple replacement insert (23) to remaining vane (21). Insert (23) includes columnar grains that extend along a trailing edge of vane (21) such that grain boundaries are substantially eliminated normal to the edge of the insert (23). Notably, Wachtell does not describe nor suggest providing a replacement blade portion that is produced using a substantially similar method as was used to produce the removed portion wherein the method includes at least one of forging and casting. Rather, Wachtell describes casting vanes and reworking the cast vanes.

Wang describes a method for repairing an airfoil (34). A computer (60) generates a numerically-controlled (NC) tool path for use by an NC machine (62) with a tool holder (64) and cutting tool (68). A plate is welded to the surface of a fan blade (8) with a weld material of the same material as the plate and fan blade (8). A displacement-sensing probe (66) scans the shape of fan blade (8), including the weld-repaired airfoil portion (34), and sends the data to computer (60). An NC tool path is then generated to blend the weld-repaired region smoothly with its adjacent surfaces. Notably, Wang does not describe nor suggest providing a replacement blade portion that is produced using a substantially similar method used to produce the removed portion wherein the method includes at least one of forging and casting.

Claim 1 recites a method of replacing a portion of a gas turbine engine rotor blade, wherein the method comprises “providing a replacement blade portion that is produced using a substantially similar method as was used to produce the removed portion wherein the method includes at least one of forging and casting.”

Applicants respectfully submit that no combination of Meier and Wachtell or Meier, Wang, and Wachtell describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. Specifically, no combination of Meier and Wachtell or Meier, Wang, and Wachtell describes nor suggests providing a replacement blade portion that is produced using a substantially similar method used to produce the removed portion wherein the method includes at least one of forging and casting. Rather, in contrast to the invention, Meier describes coupling cast vanes to forged rotors, Wachtell describes method of casting vanes and reworking the cast vanes, and Wang merely describes coupling a

plate to a blade and generating a numerically-controlled tool path to blend the weld-repaired region.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted as patentable over Meier in view of Wachtell and Meier in view of Wang and Wachtell.

Claim 4 has been cancelled. Claims 3, 5, and 6 depend from independent Claim 1. When the recitations of Claims 3, 5, and 6 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claims 3, 5, and 6 likewise are patentable over Meier in view of Wachtell and Meier in view of Wang and Wachtell.

For at least the reasons set forth above, Applicants respectfully request that the rejection of Claims 1 and 3-6 under Section 103 be withdrawn.

The rejection of Claim 22 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 6,438,838 (Meier) in view of U.S. Patent 6,912,446 (Wang) and U.S. Patent 3,650,635 (Wachtell) as applied to Claim 1 and further in view of U.S. Patent 6,238,187 (Dulaney) is respectfully traversed.

Meier, Wang, and Wachtell are described above.

Dulaney describes a method for repairing a damaged airfoil. The repair method includes removing (step 24) damaged portions or sections (12 and 16, for example) of an airfoil (10) and replacing (step 26) these portions (12 and 16) with replacement pieces (44 and 46, for example). Replacement pieces (44 and 46) are integrally joined to airfoil (10) using a joining (step 28) operation to form a refurbished airfoil that includes a seam (78) defined between airfoil (10) and the replacement piece (44 and 46). The refurbished airfoil is then shaped (step 29) by removing the excess material from replacement piece (44 and 46) and seam (78) to return the joined airfoil to predetermined dimensional tolerances. A laser shock peening treatment (step 30) induces the formation of compressive residual stresses at the seam (78). Notably, Dulaney does not describe nor suggest providing a replacement blade portion that is produced using a substantially similar method used to produce the removed portion wherein the method includes at least one of forging and casting.

Claim 22 depends from independent Claim 1, which is recited above.

Applicants respectfully submit that no combination of Meier, Wachtell, Wang, and Dulaney describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1.

Specifically, no combination of Meier, Wachtell, Wang, and Dulaney describes nor suggests providing a replacement blade portion that is produced using a substantially similar method used to produce the removed portion wherein the method includes at least one of forging and casting. Rather, in contrast to the invention, Meier describes coupling cast vanes to forged rotors, Wachtell describes method of casting vanes and reworking the cast vanes, Wang merely describes coupling a plate to a blade and generating a numerically-controlled tool path to blend the weld-repaired region, and Dulaney merely describes coupling a replacement piece to an airfoil by securing the joined airfoil in a rigid machine tooling for shaping and laser shock peening.


Accordingly, for at least the reasons set forth above, Claim 1 is submitted as patentable over Meier in view of Wang and Wachtell and further in view of Dulaney.

When the recitations of Claim 22 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claim 22 likewise is patentable over Meier in view of Wang and Wachtell and further in view of Dulaney.

For at least the reasons set forth above, Applicants respectfully request that the rejection of Claim 22 under Section 103 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



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